

WHAT IS CLAIMED IS:

1. An apparatus comprising:  
  
a timing error detector to detect a timing error for symbol sampling, the timing error detector to detect an amount of timing error based upon a value of an intersymbol sample as compared to an average value of a plurality of symbol samples.
2. The apparatus of claim 1 wherein the timing error detector is adapted to detect an amount of timing error based upon a value of an intersymbol sample minus an average value of a plurality of symbol samples, the intersymbol sample located between at least two of the plurality of symbol samples.
3. The apparatus of claim 1 wherein the timing error detector is adapted to detect an amount of timing error based upon an average of the values for first and second symbol samples minus a value of an intersymbol sample between the first and second symbol samples.
4. The apparatus of claim 3 wherein the first sample is a sample of a first symbol, and the second sample is of a second symbol, the first and second symbols being successive symbols, and the intersymbol sample being a sample taken between the first and second symbol samples.

5. The apparatus of claim 1 wherein the timing error detector is adapted to interpolate or estimate a value of the intersymbol sample based on one or more other sample values.

6. The apparatus of claim 3 wherein the timing error detector is adapted to measure the value of the intersymbol sample at a sampling point that is approximately mid-way between the first and second symbol samples.

7. The apparatus of claim 1 wherein the timing error detector is adapted to sign normalize the amount of timing error based on one or more of the signs of the first and second symbol samples.

8. The apparatus of claim 1 wherein the timing error detector is adapted to sign normalize the amount of timing error by multiplying the amount of timing error by the sign of the value of one of the symbol samples.

9. The apparatus of claim 1, wherein the apparatus further comprises a demodulator.

10. The apparatus of claim 1 wherein the apparatus further comprises a transceiver.

11. The apparatus of claim 3 wherein the timing detector is adapted to first determine whether there has been a sign change, either positive to negative or negative to positive from the values of the first and second symbol samples before detecting the amount of timing error.

12. The apparatus of claim 1 wherein the timing error detector is adapted to detect an amount of timing error for both in-phase (I) and quadrature (Q) signals.

13. An apparatus comprising:  
a timing error detector to detect a timing error for symbol sampling, the timing error detector adapted to detect an amount of timing error based upon at least a portion of a sum of the values for first and second symbol samples, as compared to a value of an intersymbol sample taken between the first and second symbol samples.

14. The apparatus of claim 13 wherein the timing error detector is adapted to detect an amount of timing error based upon one half of the sum of the values for first and second symbol samples, as compared to a value of the intersymbol sample between the first and second symbol samples.

15. The apparatus of claim 13 wherein the timing error detector is adapted to detect an amount of timing error for both in-phase (I) and quadrature (Q) signals.

16. An apparatus comprising:  
a timing error detector to detect an amount of timing error for symbol sampling, the timing error detector adapted to determine whether there has been a sign change, either positive to negative or negative to positive, from the values of first and second symbol samples, and if so, then to detect an amount of timing error based upon the difference between:

an average of the values for first and second symbol samples; and  
the value of an intersymbol sample between the first and second symbol samples.

17. An apparatus of claim 16 wherein the apparatus comprises a demodulator.

18. The apparatus of claim 16 wherein the intersymbol sample is taken at a point that is approximately mid-way between the first and second symbol samples.